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ABSTRACT

Published research on vocational interests and personality has not often assessed the characteristics of workers and the work environment in blue-collar, women-dominated industries. This study administered the Self-Directed Search (Form E) to 318 sewing machine operators in three clothing factories. Holland codes, productivity, job satisfaction, absenteeism, and insurance claims were assessed. Contrary to Holland's (1977) conventional-realistic classification of this work environment, most subjects obtained a social code. Holland code predicted satisfaction on only one measure ($p < .03$), with social subjects most satisfied, conventional and realistic subjects moderately satisfied, and other-coded subjects least satisfied. Productivity results were similar. Holland code did not affect absenteeism or insurance claims. The hypothesis that environment-personality congruence promotes satisfaction and productivity, and reduces absenteeism and injury was not supported. (Author/NB)

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HOLLAND CODE, JOB SATISFACTION AND PRODUCTIVITY IN CLOTHINC FACTORY WORKERS

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Holland Code, Job Satisfaction and
Productivity in Clothing Factory Workers

Abstract

Sewing machine operators (N = 318) in three clothing factories were administered the Self Directed Search (Form E). Holland codes, productivity, job satisfaction, absenteeism, and insurance claims were assessed. Contrary to Holland's (1977) conventional-realistic classification of this work environment, most subjects obtained a social code. Holland code predicted satisfaction on only one measure ($p < .03$), with social subjects most satisfied, conventional and realistic subjects moderately satisified, and other-coded subjects least satisfied. Productivity results were similar. Holland code did not affect absenteeism or insurance claims. The hypothesis that environment-personality congruence promotes satisfaction and productivity, and reduces absenteeism and injury was not supported.

Holland Code, Job Satisfaction and
Productivity in Clothing Factory Workers

Published research on vocational interests and personality has not often assessed the characterisitcs of workers and the work environment in blue-collar, women-dominated industries, such as the garment industry. A search of the vocational literature uncovered only three empirical studies addressing career issues of blue-collar women (Walsh, Hildebrand, Ward, & Matthews, 1983; Ward & Walsh, 1981; Salomone & Slaney, 1978). For vocational theory to be sufficiently useful, it must generalize beyond white-collar male workers to blue collar and female workers.

Few applications of Holland's (1985) theory have extended to nonprofessionals and those without college degrees. Werner (1974) studied the Vocational Preference Inventory (VPI; Holland, 1972) profiles of high school students and their achievement in different types of occupational training. Students whose Holland code and environment were congruent had higher achievement scores than students for whom they were incongruent. However, satisfaction was related to congruence only for males. Fishburne and Walsh (1976) found two scales of the VPI and four on the Self-Directed Search (SDS; Holland, 1972) that differentiated skilled (nonprofessional) occupations, consistent with the Holland scheme. They considered the SDS an appropriate instrument in using Holland's theory to study nonprofessional workers. In a study of employment census data and vocational types, Gottfredson, Holland, and Gottfredson (1975) found that occupations varied considerably by education level and gender. More realistic (R) occupations were available for men and more conventional (C) occupations were available for women with some high school education. Salomone and Slaney (1978) found that nonprofessional workers made occupational choices consistent with their Holland code, based on ratings of their present jobs and responses on the VPI. This study provided evidence that the Holland classification system was applicable to nonprofessional workers.

Crucial to Holland's theory is the concept of congruence. According to Holland (1973, pp. 39-40, 1979, p. 4), vocational choice, satisfaction, achievement, competence, and social behavior should be predictable from person-environment congruence. Holland's update of his theory maintains that vocational satisfaction and achievement depend on congruence between personality and work: Congruence results in more satisfaction and effectiveness; incongruence results in

less satisfaction and effectiveness (Holland, 1985, pp. 10-13, 50-51).

Reseach investigating the predicted outcomes between personality-environment congruence, behavior, and satisfaction has yielded mixed evidence. Several studies have been supportive of the Holland hypotheses (Gaffey & Walsh, 1978; Holland, 1968, Lacey, 1971; Mount & Muchinsky, 1978b; Osipow, Ashby, & Wall, 1966, Weiner & Klein, 1978; Wiggins, 1976); and several others have not (Cairo, 1982, Dolliver, Irvin, & Bigley, 1972; Hughes, 1972, Mount & Muchinsky, 1978a). Moreover, these studies were confined to samples of college students, graduates, and professionals. Explanations and reconciliations of this congruence literature have been similarly restricted to white-collar professions (Campbell & Klein, 1975), Kunce, Decker, & Eckelman, 1976; Weiner & Klein, 1978).

This study extends the application of Holland's (1985) theory beyond the laboratory and the white-collar work environment into a female-dominated, blue-collar work environment. In addition, this research assesses the likelihood of a systematic relationship between work environment-work personality congruence, on the one hand, and such variables as satisfaction, productivity, absenteeism, and injury, on the other.

The first hypothesis predicts which work personalities should predominate the work place. More specifically, the sewing machine operators' environment is, according to Holland, a conventional-realistic (CR) environment. The Strong-Campbell Interest Inventory (SCII; Campbell & Hansen, 1981) also codes that environment CR. Therefore, most of the workers who are employed there should have either a C or an R Code as their top personality code.

The second hypothesis is that there should be a relationship between environent-personality congruence and job satisfaction. This CR environment should be more satisfying for the C and R sewing machine operators than for the others.

The next four hypotheses relate to vocational achievement, competence, and social behavior. A tenet of Holland's theory is that congruence predicts the level of vocational achievement (Holland, 1985, p. 55; Holland, 1973, p. 35). Holland also stated that a person in a congruent environment will "...do competent work, be satisfied and personally effective, and engage in appropriate social and educational behavior" (Holland, 1973, p. 40).

The third hypothesis is that productivity on the job should be a function of this congruence between work environment and Holland code. Productivity is seen in this study as an indicator of competent work. In particular, this CR work

environment should result in the highest productivity for C and R workers.

The fourth hypothesis is that absenteeism on the job should also be a function of the congruence between work environment and work personality. Absenteeism is seen in this study as an index of both competent work and appropriate social behavior. In this case, C and R workers should be absent less often than other workers.

The fifth hypothesis is that injuries on the job should be predicted by the congruence between work environment and work personality. This stems from past research on the relationship between vocational interests and accident-proneness (Kunce, 1967; Kunce & Reeder, 1974). In this study, injury is seen as an index of personal effectiveness. In this case, C and R workers should report fewer injuries on the job on Worker's Compensation reports (a relatively crude measure) and should have been paid fewer health insurance dollars for work-related injuries (a more refined measure, but vulnerable to distortion of means due to extreme scores).

Method

Subjects

Participants in the study were 318 sewing machine operators employed by one company in 3 nonunionized textile factories in rural southern Alabama. Three of the subjects were men and 315 were women. They ranged in age from 18 to 66 years, with a mean age of 35.8. Twenty-nine had received some college training but the group mean for schooling was 10.4 years. Their average time on the job was 5.2 years, with a range of one month to 33 years. Excluding two small groups of workers just acquiring new skills, all available operators participated in the study.

Procedure

Subjects were brought into their factory's designated break room directly from their work stations. Groups varied in size from 11 to 38, according to subject availability and breakroom capacity. Subjects were seated in metal chairs around rectangular tables in two small breakrooms or seated one per booth at small dining booths in a large breakroom.

The personnel manager informed subjects about the general nature of the study, introduced the researchers, then left the breakroom. Information did not reveal specific hypotheses. Packets including the research measures were distributed to subjects. Subjects were required to write their names on the research protocol, in order to match the data with salary, injury and absence information in company records. Instructions were read aloud. Subjects were told that their

participation was voluntary and subjects were offered the opportunity to decline and return to their work stations. Only one worker declined participation. Subjects were also assured that their participation would have no bearing on their salary or job status, that their responses would remain anonymous, and that managers would receive no information about individuals. Subjects were told that 30 minutes would be allotted for completion of the measures, at the end of which they should return to their work stations. An ability measure was administered, if time allowed. When time expired, subjects were thanked and dismissed.

Independent Variable

Holland code was determined by subjects' responses to the SDS. The first measure of the questionnaire packet contained pages 1-10 of the SDS-Form E (Holland, 1977). These included the activities, competencies, occupations, and self-estimates sections. The remaining sections of the SDS-Form E are devoted to calculation of Holland codes. To maximize respondents' time for research and to minimize scoring inaccuracy, Holland codes was calculated by a computer program, in accordance with SDS-Form E instructions. Single high-point codes served as the independent variable.

Dependent Variables

The first dependent measure contained in the questionnaire packet assessed subjects' satisfaction with their work. Subjects responded to the statement "I am very satisfied with my current job" on a Likert scale ranging from strongly agree (1) to strongly disagree (5). Cullen (1968, cited in Cacioppo & Petty, 1981) reported that such Likert scales, when used in groups, had a split-half reliability of +.83. Likert (1932) demonstrated that these scales correlated highly with Thurstone scales, whose construct validity is secured through an elaborate process of generating, refining and assigning numerical values to statements reflecting various positions on an attitude continuum. Five semantic-differential attitude items followed the Likert item. These items measured subjects' attitudes toward their current jobs using the terms good-bad, favorable-unfavorable, beneficial-harmful, and wise-foolish, on a 1-5 scale. Responses were totalled to provide a second assessment of workers' global attitudes toward their current work. Osgood & Suci (1955) reported that semantic differential attitude scales had test-retest reliability coefficients of +.85. Osgood, Suci, and Tannenbaum (1957) reported that the factor structure of word meanings suggested three dimensions: potency (e.g., strong-weak), activity (e.g., e.g., active-inactive), and evaluation (e.g., good-bad). The evaluation dimension corresponds to the concept of attitude, which is an

evaluation of a person, object, or situation along the positive-negative dimension. According to Osgood et al., pairs of adjectives that were opposite on the evaluation dimension, but similar on the other two dimensions could be used to measure attitudes, in a manner similar to that employed in the present study.

Productivity was assessed by hourly wage, available through the payroll office. Hourly wage was determined by multiplying the number of pieces produced per hour by the cash value associated with producing each piece (e.g., installing 10 blue jean zippers per hour X 30¢ per zipper = $3.00 per hour). Corporate and industry-wide calibrations are used to determine the cash value associated with each piece, thus equalizing wages for workers producing pieces requiring different amounts of skill and time. The resulting hourly wage appears to be a reasonably good interval measure of productivity. Parenthetically, if the resulting hourly wage were below minimum wage, a worker was actually paid minimum wage. However, in this study subjects' actual earned wage, and not minimum wage, served as the dependent variable.

Absenteeism rates were also available from the payroll office. These data were current for subjects for the year, up to the close of the month preceding the study. The rate, then, reflect totals from an eleven-month period, from January through November.

Injury on the job was assessed by recording whether or not subjects made health insurance claims for work-related injury from the group insurance policy Worker's Compensation. In addition, the dollar figure for such claims was available from the group insurance claim data, and served as a more sensitive measure of injury severity.

Data regarding demographic characteristics and education were obtained from the original employment applications submitted by each subject. These applications and insurance data were supplied by the personnel office.

Results

Hypothesis 1, regarding the preponderance of C and R workers in this CR work environment received no support. The number of C subjects was not statistically different from chance expectations, $\chi^2(63) = 7.0$, NS, and the number of R subjects was actually significantly lower than expected by chance, $\chi^2(5) = 34.8$, $p < .001$, as was the number of investigative (I), $\chi^2(2) = 40.2$, $p < .001$; artistic (A), $\chi^2(7) = 31.4$, $p < .001$; and enterprising (E) subjects, $\chi^2(1) = 42.1$, $p < .001$. Social (S) subjects, however, were significantly more frequent than expected by chance, $\chi^2(191) =$

463.4, $p < .001$. Subjects had first codes of the following: R = 6, I = 3, A = 8, S = 192, E = 2, C = 64. Twenty subjects had codes with S and C tied and 23 had other tied codes or unscorable SDSs. Because the sample distributed itself as it did, with a very large number of Ss, quite a few Cs and some Rs, and just a small number of other codes present, the independent variable of Holland code was operationalized for the ANOVAs by having only three groups: Ss, Cs and Rs (C-Rs), and all other codes, excluding tied and unscorable SDSs (see Table 1).

Insert Table 1 about here

Hypothesis 2 also was not confirmed. Analysis of the Likert item revealed a statistically-significant effect for Holland code, $F(2,229) = 3.71$, $p < .03$. A post hoc analysis resulted in only a significant difference between the S ($M = 1.95$) and miscellaneous ($M = 2.77$) subjects (range 1-5, lower scores indicate more satisfaction). C-Rs ($M = 2.20$) did not significantly differ from either Ss or miscellaneous subjects.

The analysis of semantic differential data failed to reach a conventional level of statistical significance, $F(2,175) = 2.52$, $p < .09$. However, the pattern of means for this nonsignificant trend was the same as for the Likert item.

The third hypothesis involved productivity of workers measured in dollars. A statistically significant effect also occurred here, $F(2,262) = 7.10$, $p < .001$. C-Rs ($M = \$3.44$) were significantly more productive than miscellaneous subjects ($M = \$2.24$). In addition, a post hoc analysis indicated that Ss ($M = 3.25$) were also significantly more productive than miscellaneous subjects. C-Rs and Ss did not differ in productivity. This finding is only partially consistent with the third hypothesis.

The fourth hypothesis, regarding absenteeism on the job was not supported, $F(2,251) = 2.21$, $p > .10$.. C-Rs were not absent less often than Ss and miscellaneous subjects.

The fifth hypothesis, dealing with work-related injury, suggested that workers acting in congruent environments should be injured less and have lower insurance claims than other workers. Overall, the claim rate was low (total claims = 26: 7 Workers' Compensation, 19 group insurance) and typified by wide variability in claims, from \$15 to \$6,119 (thus making ANOVA inappropriate). Because claims were few in number (too few for χ^2, because expected cell frequency was less than 5) and variable in amount, the pattern of occurrences has simply been described in Table 2. The pattern suggested that subjects of different codes were injured at

similar rates and at similar costs.

Insert Table 2 about here

Discussion

The picture that emerges from these data is quite a different one from that hypothesized. Regarding the first hypothesis, Holland's theory would predict that people gravitate toward a work environment congruent with their work personalities. Our data do not support that prediction. However, these data are consistent with results of Gottfredson et al. (1975), who found that there were more social types than available social employment opportunities for those with at least some high school education. Two other studies have found that nonprofessional women tend to have higher interests in social occupations as measured by both the VPI and SDS (Walsh et al., 1983; Ward & Walsh, 1981). Additionally, Gottfredson et al. (1975) found that 42% of the women surveyed with at least some high school education were employed in C occupations. Women in the present study appeared to have restricted occupational opportunities locally and to base vocational decisions on local possibilities for employment.

Regarding the remaining hypotheses, C and R subjects were not generally more satisifed, productive, or able, nor were they less frequently absent or injured than others. Cs and Rs were more productive than miscellaneous subjects, but not more than Ss. Cs and Rs showed greater ability than Ss, but not greater than miscellaneous subjects. Low statistical power is not a likely cause for this failure to find support for the hypotheses.

Miscellaneous subjects were the least satisfied and the least productive. C-R subjects were well matched to the job tasks, which explains their greater satisfaction and performance over miscellaneous subjects, but the superior performance of S subjects is more difficult to explain.

Although Holland (1985) has alluded to the possibility of increased job performance, achievement, and appropriate social behavior as a consequence of congruence between Holland code and work environment, not explicit theoretical axioms have not yet been advanced. The present data partly support the notion of a relationship between congruence and productivity. In addition, these data raise questions about the utility of Holland's theory for situations typified by blue collar or factory work, done by women, in rural environments.

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Table 1.

Number of subjects in each of the comparison groups.

Holland Code	N
Conventional and Realistic	70
Social	192
Miscellaneous	13
Unscorable and Ties	43
Total	318

Table 2.

Job-related insurance claims: Number of claimants, number of claims, amount per claim and total amount claimed.

Holland Code	N	Claims	$/Claim	Total $	Claims N/Total N
Conventional and Realistic	7	9	$790	$7,109	10%
Social	13	13	$1,377	$17,901	7%
Miscellaneous	2	2	$1,527	$3,054	15%
Unscorable and Ties	4	4	$1,195	$4,780	9%
Total	26	28	$1,173	$32,844	8%

Note. Dollar amount are rounded to the nearest dollar.

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